

SN. 10/647,906

ATTORNEY DOCKET No. K101:033

REMARKS

Claims 1-5 are now pending in this application for which applicants seek reconsideration.

Amendment

The specification has been amended as suggested by the examiner. Claims 1-4 also have been amended to remove the informalities identified by the examiner, namely removing the term "type" from the preamble. Moreover, the preamble of claim 1 has been further amended to improve its form, readability, and clarity, namely changing "by sandwiching the same" to --entraining the first and second pulleys--. Moreover, claim 1 has been further defined by adding the language --regardless of the line pressure generated according to the running condition--. New claim 5 has been added. No new matter has been introduced.

Art Rejection

Claims 1-4 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sawada (USP 6,217,469) in view of Kawamura (USP 6,168,547). Applicants traverse this rejection because the combination would not have taught the line pressure upper limit setting means as set forth in independent claim 1.

Independent claim 1 calls for line pressure control means for controlling the line pressure according to the running condition and line pressure upper limit setting means for setting an upper limit of the line pressure. The line pressure upper limit setting means sets the upper limit of the line pressure when the engine speed is equal to or higher than a predetermined speed. The line pressure control means controls the line pressure so that the line pressure does not exceed the upper limit of the line pressure set by the line pressure upper limit setting means regardless of the line pressure generated according to the running condition.

Sawada discloses a line pressure control system for a CVT that controls the duty ratio for operating a line pressure control valve. A lower limit of the duty ratio is set at a predetermined value higher than 0% in consideration of dead zone to ensure high response, while the lower limit of the duty ratio is switched to 0% when the vehicle or engine speed becomes greater than a predetermined value. Although Sawada mentions the dead zone and switching of the lower limit of the duty ratio, Sawada is silent regarding controlling the upper limit of line pressure.

In this regard, the examiner relied upon Kawamura for the proposition that setting the upper limit of line pressure would have been obvious. That is, the examiner asserts that Kawamura discloses line pressure upper limit setting means operable when the engine speed

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detected by the engine speed detecting means is equal to or higher than a predetermined speed (Ne(a), Ne(b)). Applicants disagree with the examiner's assessment.

Kawamura indeed discloses a line pressure control device for a CVT continuously variable transmission. Kawamura's control device includes an engine speed sensor 68 and a controller 61 that controls the line pressure according to the running condition. The controller 61 calculates CVT pressure P_{CVT}, clutch pressure P_{CLU}, lubrication pressure P_{LUB}, and sets a required pressure P_{L(e)}, which is set to the target line pressure P_L, as follows:

- (1) When the detected engine rotation speed is lower than a threshold Ne(a), the greater of P_{CVT} and P_{CLU} is set as the required pressure P_{L(e)};
- (2) When the detected engine rotation speed is higher than a threshold Ne(b) and when P_{CVT} is greater than P_{CLU}, then P_{CVT} is set as the required pressure P_{L(e)}, and when P_{CLU} is greater than P_{CVT}, the greater of P_{CLU} and P_{LUB} is set as the required pressure P_{L(e)};
- (3) When the detected engine rotation speed is between Ne(a) and Ne(b), the required pressure P_{L(e)} is calculated by a linear interpolation according to the engine rotation speed.

In Kawamura, the target line pressure P_L, which equals P_{L(e)}, can be increased up to a fixed high line pressure P_{LH} as shown in Fig. 10. When the required pressure P_{L(e)} is greater than the fixed high line pressure P_{LH}, however, the required pressure P_{L(e)} is set to the target line pressure P_L, which has no upper limit as shown in Fig. 8. See column 8, lines 5-44. The highest pressure among the CVT pressure P_{CVT}, the clutch pressure P_{CLU}, and the lubrication pressure P_{LUB} is selected as the target line pressure P_{L(e)}. As clearly shown in Fig. 8, the target line pressure (regardless of whether P_{CVT}, P_{CLU}, or P_{LUB}) increases as the engine speed increases beyond the predetermined values Ne(b) with no upper limit. The target line pressure P_{L(e)} in Kawamura thus corresponds to the line pressure generated according to the running condition, and not any upper limit of line pressure. Kawamura does not disclose or teach controlling the line pressure so that it does not exceed an upper limit regardless of the line pressure generated according to the running condition. Accordingly, even if Kawamura is deemed properly combinable with Sawada for argument's sake, the combination would not have taught controlling the upper limit of line pressure.